AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions of claims in the application.

1-2. (Canceled)

3. (Currently amended): A method of manufacturing a ~~small and high performance~~ rare earth permanent magnet ~~set forth in claim 1 or 2 characterized in that a~~ comprising the steps of:

forming a cylindrical or disc-like rare earth magnet with a hole forming an inner surface ~~or a cylindrical or prismatic rare earth magnet with no hole, that is formed~~ ,wherein the magnet has a surface to volume ratio of 2 mm^{-1} or more and a volume of 100 mm^3 or less, the forming step being accomplished by applying mechanical processing ~~such as cutting, drilling, and surface grinding or polishing~~ to a magnet block material, thereby damaging the surface of the magnet and causing a magnetic characteristic $(BH)_{max}$ of the magnet to deteriorate,

~~and has a damaged and denatured surface is supported~~

inserting an electrode wire into the hole of the magnet,

supporting the magnet on the electrode wire in a depressurized tank,

extending the electrode wire between oppositely-disposed targets in the tank,

transforming ~~and~~ an R metal (~~here,~~ R denotes at least one kind ~~or two or more kinds~~ of rare earth elements selected from the group consisting of Y, Nd, Dy, Pr, Ho and Tb) or an alloy containing an R metal ~~is vaporized or transformed~~ into fine particles ~~in the depressurized tank by physical means~~ by a sputtering method,

rotating the magnet with the electrode wire as a rotation shaft,

~~and is three-dimensionally blown~~ blowing the fine particles onto the whole or part of the surface of the magnet and causing them to be deposited there,

allowing the ~~R-metal is allowed~~ fine particles to diffuse and permeate from the surface of the magnet to the inside of the magnet ~~at~~ to at least a depth corresponding to a radius of a grain exposed on the outermost surface of the magnet ~~or more~~, and thereby improving the quality of the damaged magnet surface ~~a~~ portion ~~damaged and denatured by the mechanical processing is improved~~ so that the magnetic characteristic $(BH)_{max}$ is recovered to 280 kJ/m^3 or more.

4. (Currently amended): A method of manufacturing a ~~small and high performance~~ rare earth permanent magnet as set forth in claim 3 ~~characterized in that~~ , wherein the step of blowing the fine particles and causing them to be deposited on the magnet is carried out at the same time as the step of allowing the fine particles to diffuse and permeate the magnet ~~diffusion and permeation are carried out as deposition is carried out~~.

5-7. (Canceled)

8. (Currently amended): A method of manufacturing ~~a small and high performance~~ rare earth permanent magnet as set forth in ~~claim 7~~ claim 3 characterized in that the oppositely-disposed targets are ring-like targets disposed concentrically about the center axis of the cylindrical or disc-like magnet.

9. (New): A method of manufacturing a rare earth permanent magnet comprising the steps of:

forming

a cylindrical or disc-like rare earth magnet with a hole forming an inner surface or a cylindrical or

prismatic rare earth magnet with no hole,

wherein the magnet has a surface to volume ratio of 2 mm^{-1} or more and a volume of 100 mm^3 or less, the forming step being accomplished by applying mechanical processing to a magnet block material, thereby damaging the surface of the magnet and causing a magnetic characteristic $(BH)_{max}$ of the magnet to deteriorate,

packing the magnet in a wire basket to be freely tumbled,

supporting the wire basket in a depressurized tank,

vaporizing an R metal (R denotes at least one kind of rare earth elements selected from the group consisting of Y, Nd, Dy, Pr, Ho and Tb) or an alloy containing an R metal in the depressurized tank by physical means,

blowing the R-metal vapor onto the whole or part of the surface of the magnet and causing deposition of the vapor there,

allowing the R metal vapor to diffuse and permeate from the surface of the magnet to the inside of the magnet to at least a depth corresponding to a radius of a grain exposed on the outermost surface of the magnet, and thereby improving the quality of the damaged magnet surface portion so that the magnetic characteristic $(BH)_{max}$ is recovered to 280 kJ/m^3 or more.

10. (New): A method of manufacturing rare earth permanent magnet as set forth in claim 9, wherein the step of blowing the fine particles and causing them to be deposited on the magnet is carried out at the same time as the step of allowing the fine particles to diffuse and permeate the magnet.

11. (New): A method of manufacturing a rare earth permanent magnet as set forth in claim 3, wherein the step of allowing the vapor to diffuse and permeate the magnet is effected while a concentration of impurity gases from the air contained in the ambient atmosphere is reduced to 50 ppm or less.

12. (New): A method of manufacturing a rare earth permanent magnet as set forth in claim 3, wherein the magnet is an Nd-Fe-B system or Pr-Fe-B system magnet and the R metal is Dy or Tb.

13. (New): A method of manufacturing a rare earth permanent magnet as set forth in claim 9, wherein the step of allowing the vapor to diffuse and permeate the magnet is effected while a concentration of impurity gases from the air contained in the ambient atmosphere is reduced to 50 ppm or less.

14. (New): A method of manufacturing a rare earth permanent magnet as set forth in claim 9,

wherein the magnet is an Nd-Fe-B system or Pr-Fe-B system magnet and the R metal is Dy or Tb.